

What is claimed is:

1. A magnetizing fixture for connection to an electrical power supply having a first and a second electrical connection, the magnetizing fixture comprising:
  - a. a first electrical connection to the power supply;
  - 5 b. a second electrical connection to the power supply;
  - c. an electrically conductive structure comprising a plurality of electrically conductive elements and an electrically conductive top, each element having a first end coupled to one of the first and second electrical connections, each element having a second end coupled to the electrically conductive top; and
  - 10 d. an electrically conductive core of substantial magnetic permeability having a top surface coupled to the electrically conductive top, a bottom surface, and a plurality of channels communicating from the top surface to the bottom surface, wherein the top and bottom surfaces and the channels are coated with an electrically insulating layer and wherein each electrically conductive element is contained within a channel.
- 15 2. The magnetizing fixture as defined in claim 1, wherein the channels are open.
3. The magnetizing fixture as defined in claim 2, wherein the electrically conductive elements are completely contained laterally within the channels.
- 20 4. The magnetizing fixture as defined in claim 1, wherein the insulating layer comprises a plurality of insulating sublayers.
5. The magnetizing fixture as defined in claim 4, wherein the insulating layer comprises a first and a second insulating sublayer, wherein the first insulating sublayer is comprised of nickel, chromium, aluminum, and yttrium.
- 25 6. The magnetizing fixture as defined in claim 5, wherein the insulating layer comprises a first and a second insulating sublayer, wherein the second insulating sublayer is comprised of stabilized zirconia.
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7. The magnetizing fixture as defined by claim 1 further comprising a soldering material securing the first and second electrical connections to the electrically conductive structure, the soldering material having a material melting point, the insulating layer having a melting point that is greater than the material melting point.

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8. The magnetizing fixture as defined in claim 1, wherein adjacent electrically conductive elements are connected to different electrical connections.

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9. A method of constructing a magnetizing fixture, the method comprising:  
providing an electrically conductive structure that forms an interior;  
providing an electrically conductive core of substantial magnetic permeability;  
coating at least a portion of the electrically conductive core with an electrically insulating material to form an insulated core; and  
securing the insulated core within the interior of the conductive structure.

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10. The method as defined by claim 9 further comprising forming channels in the electrically conductive core.

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11. The method as defined in claim 10, wherein forming channels includes forming channels between a top and a bottom surface of the electrically conductive core.

12. The method as defined by claim 10 wherein the conductive structure includes a plurality of conductors that fit in registry within the channels.

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13. The method as defined in claim 10, wherein coating the electrically conductive core includes coating the channels and a top and a bottom surface of the electrically conductive core.

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14. The method as defined by claim 9 wherein the insulated core is secured by soldering the conductive structure to another structure, the soldering being completed at a

soldering temperature, the electrically insulating material having a melting temperature that is greater than the soldering temperature.

15. The method as defined in claim 9, wherein coating includes applying a first  
5 layer comprising nickel, chromium, aluminum, and yttrium, and a second layer of stabilized zirconia.

16. The apparatus as produced by the method of claim 9.

10 17. A magnetizing fixture comprising:  
a conductive element forming an interior, the conductive element being capable of receiving power from a power source;  
a conductive core of substantial magnetic permeability within the interior of the conductive element; and  
15 an insulator that prevents electrical contact between at least a portion of the conductive element and the conductive core.

18. The magnetizing fixture as defined by claim 17 wherein the conductive  
element includes a plurality of legs that each are electrically connected with one of a positive  
20 terminal and a negative terminal of the power source.

19. The magnetizing fixture as defined by claim 18 wherein each leg has a first  
end and a second end, the second end of all the legs being connected, the first end of each leg  
being connected to one of the positive terminal and negative terminal of the power source.  
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20. The magnetizing fixture as defined by claim 17 wherein the insulator coats  
the conductive core.

21. The magnetizing fixture as defined by claim 17 further comprising a bar for  
30 electrically connecting with a port of a power supply, the conductive element having a connection material that connects the conductive element to the bar, the connection material

having a melting point, the insulator having a melting point that is greater than the melting point of the connection material.

22. The magnetizing fixture as defined by claim 17 wherein the conductive  
5 element is soldered to another component with solder, the solder having a solder melting point, the insulator having an insulator melting point that is greater than the solder melting point.

23. The magnetizing fixture as defined by claim 22 wherein the solder is silver  
10 solder.